WHAT IS CLAIMED IS:

1. A magnetic recording medium comprising:

a non-magnetic base film;

a non-magnetic undercoat layer formed on said non-magnetic base film, comprising a binder resin and non-magnetic acicular black iron-based composite particles; and

a magnetic coating film formed on said non-magnetic undercoat layer, comprising a binder resin and magnetic particles,

said non-magnetic acicular black iron-based composite particles having an average major axis diameter of usually 0.011 to 0.35 μm, comprising:

acicular hematite particles or acicular iron oxide hydroxide particles;

a coating layer formed on the surface of said acicular hematite particle or acicular iron oxide hydroxide particle, comprising at least one organosilicon compound selected from the group consisting of:

(1) organosilane compounds obtained from an alkoxysilane compounds, and

(2) polysiloxanes or modified polysiloxanes; and

a single carbon black coat formed on at least a part of said coating layer comprising said organosilicon compound, in an amount of 21 to 50 parts by weight based on 100 parts by weight of said acicular hematite particles or acicular iron

oxide hydroxide particles.

2. A magnetic recording medium according to claim 1, wherein said acicular hematite particles or acicular iron oxide hydroxide particles are particles having a coat formed on at least a part of the surface of said acicular hematite particles or acicular iron oxide hydroxide particles and comprising at least one compound selected from the group consisting of hydroxides of aluminum, oxides of aluminum, hydroxides of silicon and oxides of silicon in an amount of 0.01 to 50 % by weight, calculated as Al or $SiO_2$, based on the total weight of the acicular hematite particles or acicular iron oxide hydroxide particles.

3. A magnetic recording medium according to claim 1, wherein said modified polysiloxanes are ones selected from the group consisting of:

(A) polysiloxanes modified with at least one compound selected from the group consisting of polyethers, polyesters and epoxy compounds, and

(B) polysiloxanes whose molecular terminal is modified with at least one group selected from the group consisting of carboxylic acid groups, alcohol groups and a hydroxyl group.

4. A magnetic recording medium according to claim 1,

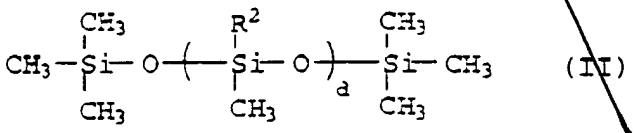
wherein said alkoxysilane compound is represented by the general formula (I):

$$R^1_aSiX_{4-a} \qquad (I)$$

wherein $R^1$ is $C_6H_5$-, $(CH_3)_2CHCH_2$- or n-$C_bH_{2b+1}$- (wherein b is an integer of 1 to 18); X is $CH_3O$- or $C_2H_5O$-; and a is an integer of 0 to 3.

5. A magnetic recording medium according to claim 4, wherein said alkoxysilane compound is methyltriethoxysilane, dimethyldiethoxysilane, phenyltriethoxysilane, diphenyldiethoxysilane, methyltrimethoxysilane, dimethyldimethoxysilane, phenyltrimethoxysilane, diphenyldimethoxysilane, isobutyltrimethoxysilane or decyltrimethoxysilane.

6. A magnetic recording medium according to claim 1, wherein said polysiloxanes are represented by the general formula (II):

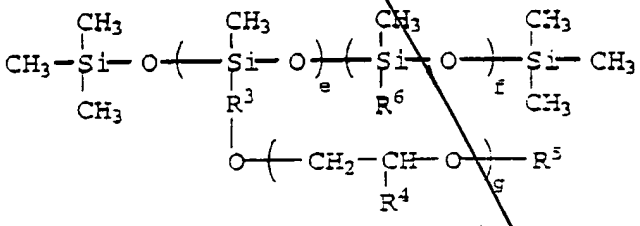


(II)

wherein $R^2$ is H- or particle, particle-, and d is an integer of 15 to 450.

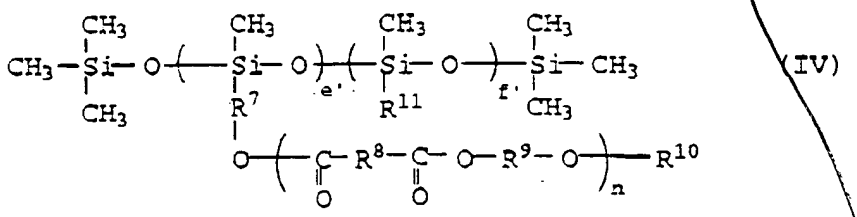
7. A magnetic recording medium according to claim 6, wherein said polysiloxanes are ones having methyl hydrogen siloxane units.

8. A magnetic recording medium according to claim 3, wherein said polysiloxanes modified with at least one compound selected from the group consisting of polyethers, polyesters and epoxy compounds are represented by the general formula (III), (IV) or (V):



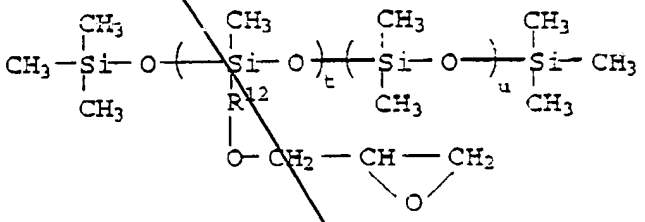
(III)

wherein $R^3$ is $-(-CH_2-)_h-$; $R^4$ is $-(-CH_2-)_i-CH_3$; $R^5$ is -OH, -COOH, $-CH=CH_2$, $-C(CH_3)=CH_2$ or $-(-CH_2-)_j-CH_3$; $R^6$ is $-(-CH_2-)_k-CH_3$; g and h are an integer of 1 to 15; i, j and k are an integer of 0 to 15; e is an integer of 1 to 50; and f is an integer of 1 to 300;



(IV)

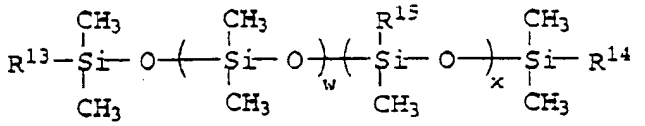
wherein $R^7$, $R^8$ and $R^9$ are $-(-CH_2-)_q-$ and may be the same or different: $R^{10}$ is -OH, -COOH, $-CH=CH_2$, $-C(CH_3)=CH_2$ or $-(-CH_2-)_r-CH_3$; $R^{11}$ is $-(-CH_2-)_s-CH_3$; n and q are an integer of 1 to 15; r and s are an integer of 0 to 15; e' is an integer of 1 to 50; and f' is an integer of 1 to 300; or



(V)

wherein $R^{12}$ is $-(-CH_2-)_v-$; v is an integer of 1 to 15; t is an integer of 1 to 50; and u is an integer of 1 to 300.

9. A magnetic recording medium according to claim 3, wherein said polysiloxanes whose molecular terminal is modified with at least one group selected from the group consisting of carboxylic acid groups, alcohol groups and a hydroxyl group are represented by the general formula (VI):



(VI)

wherein $R^{13}$ and $R^{14}$ are -OH, $R^{16}OH$ or $R^{17}COOH$ and may be the

same or different; $R^{15}$ is $-CH_3$ or $-C_6H_5$; $R^{16}$ and $R^{17}$ are $-(-CH_2-)_y-$; y is an integer of 1 to 15; w is an integer of 1 to 200; and x is an integer of 0 to 100.

10. A magnetic recording medium according to claim 1, wherein said acicular hematite particles are acicular manganese-containing hematite particles.

11. A magnetic recording medium according to claim 1, wherein said acicular iron oxide hydroxide particles are acicular manganese-containing goethite particles.

12. A magnetic recording medium according to claim 1, wherein the amount of said coating organosilicon compounds is 0.02 to 5.0 % by weight, calculated as Si, based on the total weight of the organosilicon compounds and said acicular hematite particles or acicular iron oxide hydroxide particles.

13. A magnetic recording medium according to claim 1, wherein the thickness of said carbon black coat is not more than 0.06 μm.

14. A magnetic recording medium according to claim 1, wherein said non-magnetic acicular black iron-based composite particles have an absorption amount of myristic acid of 0.01

to 0.3 mg/m$^2$.

15. A magnetic recording medium according to claim 1, said non-magnetic acicular black iron-based composite particles have an average minor axis diameter of 0.006 to 0.18 μm, an aspect ratio of 2:1 to 20:1, a BET specific surface area of 35 to 300 m$^2$/g, a geometrical standard deviation value of the average major axis diameter of not more than 1.50.

16. A magnetic recording medium according to claim 1, which further comprises a gloss of coating film of 130 to 300 %, a surface roughness Ra of coating film of not more than 12.0 nm, a linear absorption of coating film of 1.90 to 10.00 μm$^{-1}$, a surface resistivity of not more than 1 × 10$^9$ Ω/cm$^2$, and a coefficient of friction of 0.05 to 0.30.

17. A magnetic recording medium according to claim 2, which further comprises a gloss of coating film of 135 to 300 %, a surface roughness Ra of coating film of not more than 11.5 nm, a linear absorption of coating film of 1.90 to 10.00 μm$^{-1}$, a surface resistivity of not more than 1 × 10$^9$ Ω/cm$^2$, and a coefficient of friction of 0.05 to 0.30.

~~18. Non-magnetic acicular black iron-based composite~~

particles having an average major axis diameter of usually 0.011 to 0.35 μm, comprising:

acicular hematite particles or acicular iron oxide hydroxide particles;

a coating layer formed on the surface of said acicular hematite particle or acicular iron oxide hydroxide particle, comprising at least one organosilicon compound selected from the group consisting of:

(1) organosilane compounds obtained from an alkoxysilane compounds, and

(2) polysiloxanes or modified polysiloxanes; and

a single carbon black coat formed on at least a part of said coating layer comprising said organosilicon compound, in an amount of 21 to 50 parts by weight based on 100 parts by weight of said acicular hematite particles or acicular iron oxide hydroxide particles.

19. Non-magnetic acicular black iron-based composite particles according to claim 18, wherein said acicular hematite particles or acicular iron oxide hydroxide particles are particles having a coat formed on at least a part of the surface of said acicular hematite particles or acicular iron oxide hydroxide particles and comprising at least one compound selected from the group consisting of hydroxides of aluminum, oxides of aluminum, hydroxides of silicon and

oxides of silicon in an amount of 0.01 to 50 % by weight, calculated as Al or $SiO_2$, based on the total weight of the acicular hematite particles or acicular iron oxide hydroxide particles.

20. Non-magnetic acicular black iron-based composite particles according to claim 18, wherein said modified polysiloxanes are ones selected from the group consisting of:

(A) polysiloxanes modified with at least one compound selected from the group consisting of polyethers, polyesters and epoxy compounds, and

(B) polysiloxanes whose molecular terminal is modified with at least one group selected from the group consisting of carboxylic acid groups, alcohol groups and a hydroxyl group.

21. Non-magnetic acicular black iron-based composite particles according to claim 18, wherein said alkoxysilane compound is represented by the general formula (I):

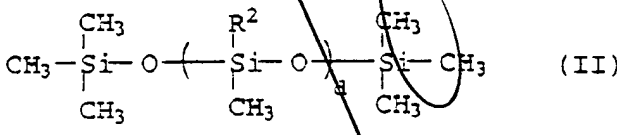
$$R^1_aSiX_{4-a} \qquad (I)$$

wherein $R^1$ is $C_6H_5$-, $(CH_3)_2CHCH_2$- or n-$C_bH_{2b+1}$- (wherein b is an integer of 1 to 18); X is $CH_3O$- or $C_2H_5O$-; and a is an integer of 0 to 3.

22. Non-magnetic acicular black iron-based composite

particles according to claim 21, wherein said alkoxysilane compound is methyltriethoxysilane, dimethyldiethoxysilane, phenyltriethoxysilane, diphenyldiethoxysilane, methyltrimethoxysilane, dimethyldimethoxysilane, phenyltrimethoxysilane, diphenyldimethoxysilane, isobutyltrimethoxysilane or decyltrimethoxysilane.

23. Non-magnetic acicular black iron-based composite particles according to claim 18, wherein said polysiloxanes are represented by the general formula (II):



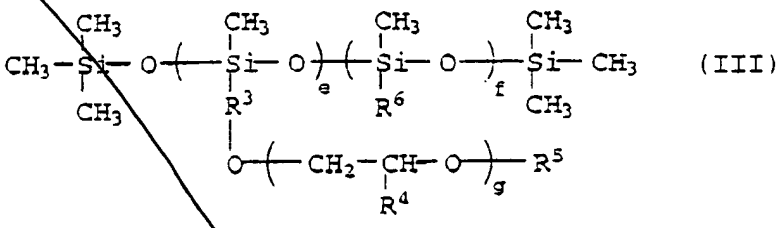
(II)

wherein $R^2$ is H- or particle, particle-, and d is an integer of 15 to 450.

24. Non-magnetic acicular black iron-based composite particles according to claim 23, wherein said polysiloxanes are ones having methyl hydrogen siloxane units.

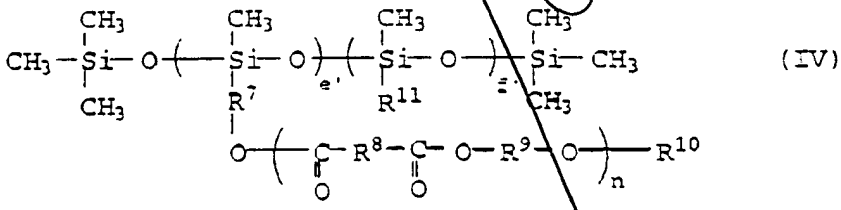
25. Non-magnetic acicular black iron-based composite particles according to claim 20, wherein said polysiloxanes modified with at least one compound selected from the group consisting of polyethers, polyesters and epoxy compounds are

represented by the general formula (III), (IV) or (V):



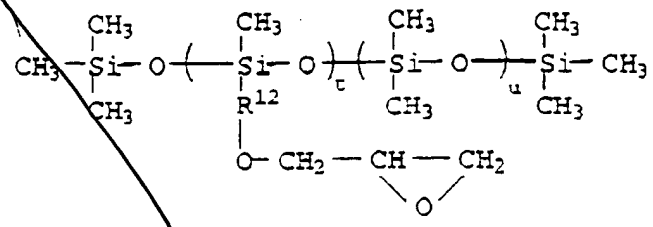
(III)

wherein $R^3$ is $-(-CH_2-)_h-$; $R^4$ is $-(-CH_2-)_i-CH_3$; $R^5$ is -OH, -COOH, $-CH=CH_2$, $-C(CH_3)=CH_2$ or $-(-CH_2-)_j-CH_3$; $R^6$ is $-(-CH_2-)_k-CH_3$; g and h are an integer of 1 to 15; i, j and k are an integer of 0 to 15; e is an integer of 1 to 50; and f is an integer of 1 to 300;



(IV)

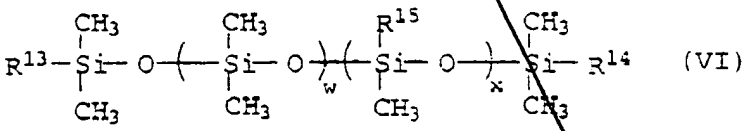
wherein $R^7$, $R^8$ and $R^9$ are $-(-CH_2-)_q-$ and may be the same or different; $R^{10}$ is -OH, -COOH, $-CH=CH_2$, $-C(CH_3)=CH_2$ or $-(-CH_2-)_r-CH_3$; $R^{11}$ is $-(-CH_2-)_s-CH_3$; n and q are an integer of 1 to 15; r and s are an integer of 0 to 15; e' is an integer of 1 to 50; and f' is an integer of 1 to 300; or



(V)

wherein $R^{12}$ is $-(-CH_2-)_v-$; v is an integer of 1 to 15; t is an integer of 1 to 50; and u is an integer of 1 to 300.

26. Non-magnetic acicular black iron-based composite particles according to claim 20, wherein said polysiloxanes whose molecular terminal is modified with at least one group selected from the group consisting of carboxylic acid groups, alcohol groups and a hydroxyl group are represented by the general formula (VI):



(VI)

wherein $R^{13}$ and $R^{14}$ are -OH, $R^{16}OH$ or $R^{17}COOH$ and may be the same or different; $R^{15}$ is $-CH_3$ or $-C_6H_5$; $R^{16}$ and $R^{17}$ are $-(-CH_2-)_y-$; y is an integer of 1 to 15; w is an integer of 1 to 200; and x is an integer of 0 to 100.

27. Non-magnetic acicular black iron-based composite particles according to claim 18, wherein said acicular

hematite particles are acicular manganese-containing hematite particles.

28. Non-magnetic acicular black iron-based composite particles according to claim 18, wherein said acicular iron oxide hydroxide particles are acicular manganese-containing goethite particles.

29. Non-magnetic acicular black iron-based composite particles according to claim 18, wherein the amount of said coating organosilicon compounds is 0.02 to 5.0 % by weight, calculated as Si, based on the total weight of the organosilicon compounds and said acicular hematite particles or acicular iron oxide hydroxide particles.

30. Non-magnetic acicular black iron-based composite particles according to claim 18, wherein the thickness of said carbon black coat of not more than 0.06 μm.

31. Non-magnetic acicular black iron-based composite particles according to claim 18, which further comprises an absorption amount of myristic acid of 0.01 to 0.3 mg/m$^2$.

32. Non-magnetic acicular black iron-based composite particles according to claim 18, which further comprises an

average major axis diameter of 0.006 to 0.18 μm, an aspect ratio of 2:1 to 20:1, a BET specific surface area of 35 to 300 $m^2/g$, a geometrical standard deviation value of the average major axis diameter of not more than 1.50.

~~23~~. A non-magnetic substrate comprising:

a non-magnetic base film; and

a non-magnetic undercoat layer formed on said non-magnetic base film, comprising a binder resin and non-magnetic acicular black iron-based composite particles having an average major axis diameter of usually 0.011 to 0.35 μm, comprising:

acicular hematite particles or acicular iron oxide hydroxide particles;

a coating layer formed on the surface of said acicular hematite particle or acicular iron oxide hydroxide particle, comprising at least one organosilicon compound selected from the group consisting of:

(1) organosilane compounds obtained from an alkoxysilane compounds, and

(2) polysiloxanes or modified polysiloxanes; and

a single carbon black coat formed on at least a part of the coating layer comprising the organosilicon compound coated, in an amount of 21 to 50 parts by weight based on 100 parts by weight of the acicular hematite particles or

acicular iron oxide hydroxide particles.

34. A non-magnetic substrate according to claim 33, wherein said acicular hematite particles or acicular iron oxide hydroxide particles are particles having a coat formed on at least a part of the surface of said acicular hematite particles or acicular iron oxide hydroxide particles and comprising at least one compound selected from the group consisting of hydroxides of aluminum, oxides of aluminum, hydroxides of silicon and oxides of silicon in an amount of 0.01 to 50 % by weight, calculated as Al or $SiO_2$, based on the total weight of the acicular hematite particles or acicular iron oxide hydroxide particles.

35. A non-magnetic substrate according to claim 33, which further comprises a gloss of coating film of 170 to 280 %, a surface roughness Ra of coating film of 2.0 to 12.0 nm, a linear absorption of coating film of 1.50 to 5.00 $\mu m^{-1}$, and a surface resistivity of $1 \times 10^3$ to $1 \times 10^{11}$ $\Omega/cm^2$.

36. A non-magnetic substrate according to claim 34, which further comprises a gloss of coating film of 175 to 280 %, a surface roughness Ra of coating film of 2.0 to 11.5 nm, a linear absorption of coating film of 1.50 to 5.00 $\mu m^{-1}$, and a surface resistivity of $1 \times 10^3$ to $1 \times 10^{11}$ $\Omega/cm^2$.